

## Homework 1

1. A body at a certain location has a mass of  $2.0 \text{ kg}$  and weighs  $19.0 \text{ N}$  on a spring balance. What is the acceleration due to gravity at this location?
2. Find the height of the free surface if  $0.8 \text{ ft}^3$  of water is poured into a conical tank  $20\text{-in}$  high with a base radius of  $10\text{-in}$ . How much additional water is required to fill the tank?
3. Calculate the pressure, in  $\text{kPa}$ , at  $A$ ,  $B$ ,  $C$ , and  $D$  in Fig. 3.

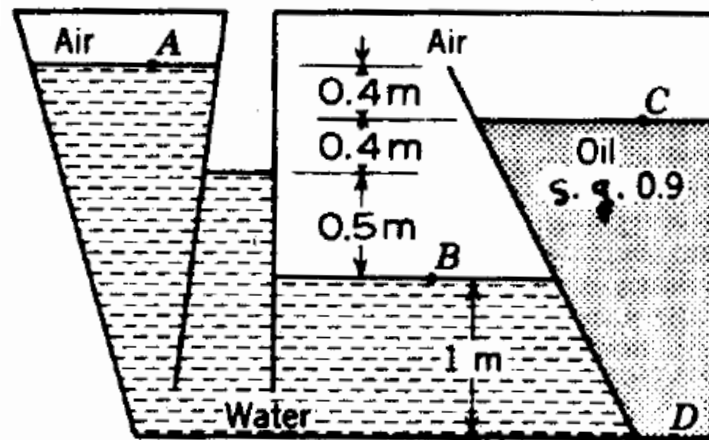


Figure 3

4. A manometer connects an oil pipeline and a water pipeline as shown in Fig. 4. Determine the difference in pressure between the two pipelines using the readings on the manometer. Use  $s_{oil} = 0.86$  and  $s_{Hg} = 13.6$ .

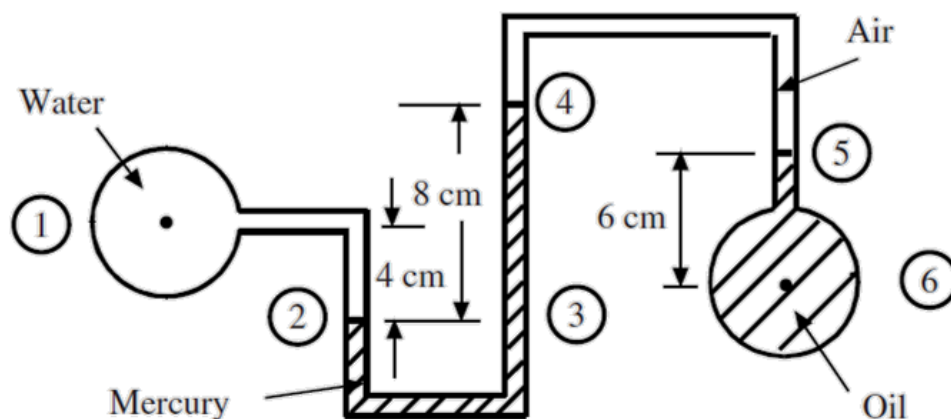


Figure 4

5. Fig. 5 shows a conical vessel having its outlet at A to which a U-tube manometer is connected. The reading of the manometer given in the figure shows when the vessel is empty. Find the reading of the manometer when the vessel is completely filled with water.

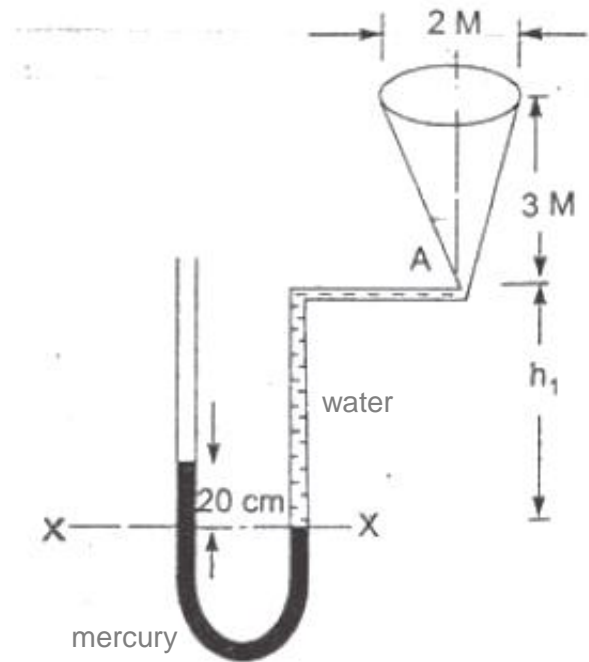


Figure 5